

We claim:

1. An automatic sliding door closure device, the device comprising:
 - a housing sized and shaped for attachment to an end of a sliding door during use;
 - 5 a pulley rotatably mounted within the housing;
 - a first gear rotatably mounted within the housing having a plurality of radially spaced teeth;
 - a cable having an exterior end for attachment to a door frame during use and an interior end connected to the first gear rotating the first gear during use;
 - 10 tensioning means engaged with the first gear tensioning movement of the first gear;
 - a second gear within the housing having a plurality of radially spaced teeth in meshed relation with the teeth of the first gear;
 - second tensioning means engaged with the second gear tensioning movement of the second gear during movement of the second gear in an opposite direction from movement of the first gear;
 - 15 a connecting arm connected to the body;
 - an airtight cylinder oriented parallel with a sliding door track of the sliding door during use having a hollow interior cavity;
 - 20 a plunger arm connected to the connecting arm sized and shaped for movement within the hollow interior cavity of the airtight cylinder;
 - a flexible member connected to the plunger arm slidably contacting walls of the hollow interior cavity of the airtight cylinder; and
 - an airflow control valve within a wall of the airtight cylinder.

2. The device of claim 1 wherein the first gear has a pulley portion aligned with the pulley for keeping the cable on a front face of the first gear and the tensioning means engages the first gear at a back face of the first gear.

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3. The device of claim 2 further comprising a guide channel between the pulley and the first gear sized and shaped to receive the cable.

4. The device of claim 3 wherein the second tensioning means engages a front face of the
10 second gear and further comprises a third tensioning means engaging a back face of the second gear tensioning movement of the second gear during movement.

5. The device of claim 4 wherein the airflow control valve is located in one end of the airtight cylinder and further comprises an airtight seal about the plunger arm located in an
15 opposite end of the airtight cylinder from the airflow control valve.

6. The device of claim 5 further comprising a plunger arm side bracket sized and shaped to receive an end of the airtight cylinder having an aperture through the bracket for movement of the plunger arm within the aperture during use.

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7. The device of claim 6 further comprising an airflow control valve side bracket sized and shaped to receive an end of the airtight cylinder having an aperture through the bracket providing an opening for airflow into and out of the airflow control valve.

8. An automatic sliding door closure device in combination with a sliding door, the combination comprising:

a sliding door track within a door opening having a door frame;

a sliding door slidably engaged with the sliding door track;

5 a housing attached to an end of the sliding door;

a pulley rotatably mounted within the housing;

a first gear rotatably mounted within the housing having a plurality of radially spaced teeth;

10 a cable having an exterior end for attached to the door frame and an interior end connected to the first gear, the cable rotating the first gear when the sliding door is slid along the sliding door track;

tensioning means engaged with the first gear tensioning rotation of the first gear as the sliding door is slid along the sliding door track;

15 a second gear rotatably mounted within the housing having a plurality of radially spaced teeth in meshed relation with the teeth of the first gear, the second gear rotating in an opposite direction from the rotation of the first gear;

second tensioning means engaged with the second gear tensioning rotation of the second gear as the sliding door is slid along the sliding door track;

a connecting arm connected to the body;

20 an airtight cylinder oriented parallel with the sliding door track of the sliding door having a hollow interior cavity;

a plunger arm connected to the connecting arm sized and shaped for movement within the hollow interior cavity of the airtight cylinder as the sliding door is slid along the sliding door track;

a flexible member connected to the plunger arm slidably contacting walls of the hollow interior cavity of the airtight cylinder for creating an air cushion within the airtight cylinder; and

an airflow control valve within a wall of the airtight cylinder for controlling intake and outlet of air into the airtight cylinder, the airflow control valve controlling closure speed of the sliding door.

9. The device of claim 8 further comprising a guide channel between the pulley and the first gear sized and shaped to receive the cable.

10. The combination of claim 9 wherein the first gear has a pulley portion aligned with the pulley for keeping the cable on a front face of the first gear and the tensioning means engages the first gear at a back face of the first gear.

11. The combination of claim 10 wherein the second tensioning means engages a front face of the second gear and further comprises a third tensioning means engaging a back face of the second gear tensioning movement of the second gear during movement.

12. The combination of claim 11 wherein the airflow control valve is located in one end of the airtight cylinder and further comprises an airtight seal about the plunger arm located in an opposite end of the airtight cylinder from the airflow control valve.

13. The combination of claim 12 further comprising a plunger arm side bracket sized and shaped to receive an end of the airtight cylinder having an aperture through the bracket for movement of the plunger arm within the aperture during use.

5 14. The combination of claim 13 further comprising an airflow control valve side bracket sized and shaped to receive an end of the airtight cylinder having an aperture through the bracket providing an opening for airflow into and out of the airflow control valve.

15. An automatic sliding door closure device, the device comprising:
10 a cable having a first end attached to a door frame during use;
at least one tensioning means connected to a sliding door during use, the
tensioning means tensioned by the cable during use; and
an air piston linked to the tensioning means providing controlled release of the
tension in the tensioning means controlling closure speed of the sliding door during use.

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16. The device of claim 15 further comprising a first gear engaged with the tensioning means, the tensioning means tensioning rotation of the first gear.

17. The device of claim 16 wherein the first gear has a pulley portion for keeping the cable
20 on a front face of the first gear.

18. The device of claim 15 further comprising an airflow control valve in communication with the air piston controlling air pressure within the air piston.

19. The device of claim 18 further comprising a second gear engaged with the first gear and second tensioning means tensioning rotation of the second gear.

20. The device of claim 19 wherein the air piston further comprises a flexible member
5 slidably contacting inner walls of the piston creating an air cushion within the air piston during use.